

R E M A R K S

The Office Action dated October 21, 2003 presents the examination of claims 1, 3, 5, 6, 10 and 12-27. Claims 7-9 are withdrawn from consideration. Claims 25-27 are allowed. Claims 14 and 16 are canceled herein. Claims 1, 3, 5, 6, 12, 13 and 17-24 are currently amended. Claims 28 and 29 are added. Support is found in the specification, such as on page 5, lines 26-27. No new matter is inserted into the application.

Claim Objections

The Examiner objects to claim 6 under 37 C.F.R. § 1.75(c) for allegedly being improperly dependent from claim 5. In order to overcome this objection, Applicants amend claim 6 into independent form. Thus, the instant objection is overcome.

Rejection under 35 U.S.C. § 112, first paragraph

Written Description

The Examiner rejects claims 1, 3, 5, 6, 10, and 12-24 under 35 U.S.C. § 112, first paragraph for an alleged lack of written description. Claims 14 and 16 are canceled, thus rendering rejection thereof moot. Applicants respectfully traverse the rejection of the pending claims. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Claims 1, 13-14, and 17-24

The Examiner maintains her assertion that there is no support for a final mutant α -amylase sequence with at least 70% homology to SEQ ID NO:1. In order to overcome this rejection, Applicants amend claims 1 and 13 to recite that the final mutant sequence is at least 95% homologous to SEQ ID NO:1.

Claims 3, 5, 6, 10, and 12-24

The Examiner asserts that there is no support for a parent α -amylase sequence having 95% homology to SEQ ID NO:1. On the other hand, the Examiner states that the specification does support a parent sequence having at least 70% homology to SEQ ID NO:1. In order to answer this rejection, claims 3, 5, 6, 12, and 13 are amended to recite that the parent α -amylase sequence has at least 70% homology to SEQ ID NO:1.

Further, the Examiner asserts that the specification does not support a final mutant sequence having 95% homology to SEQ ID NO:1. Applicants respectfully disagree with the Examiner on this point. In the Reply filed on July 25, 2003, Applicants pointed out several examples of final mutant α -amylase sequences having at least 95% homology to SEQ ID NO:1 (see, the table on page 13 of the Reply). The Examiner does not seem to respond to these arguments in the outstanding Office Action. Therefore, the Examiner is requested to withdraw this rejection.

Claim 5

The Examiner asserts that the specification does not support "a substitution of a sequence corresponding to the 11th to 100th amino acid residue from the amino terminus set forth in SEQ ID NO:1." In response to the Examiner's remarks, claim 5 is amended to recite "11 to 100." Support for this amendment is found on page 7, lines 12-15 of the instant specification, wherein it is disclosed, "The improvement of heat resistance can also be achieved by replacing an amino acid sequence corresponding to 11 to 100 amino acid residues from the amino terminal (Asp) in the amino acid sequence of SEQ ID NO:1...." Withdrawal of the instant rejection is therefore respectfully requested.

New Matter

The Examiner rejects claim 13 under 35 U.S.C. § 112, first paragraph for allegedly containing new matter. Applicants respectfully traverse. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

Specifically, the Examiner asserts that the specification does not disclose that the final mutant α -amylases have the specific properties recited in claim 13. Instead, the Examiner asserts that the specification only discloses that the parent α -amylase sequences have these properties, and that the

specification only discloses that the mutants have resistance to heat and chelating agents.

In order to answer this rejection, Applicants amend claim 13 to recite that the mutant α -amylase (i) possesses increased heat resistance when compared to SEQ ID NO:1; (ii) maintains resistance to chelating agents when compared to SEQ ID NO:1; (iii) maintains high specific activity under alkaline conditions; and (iv) comprises an amino acid sequence which is at least 95% homologous to SEQ ID NO:1. Support for this amendment is found on page 10, lines 4-10 of the specification. Support for a final mutant α -amylase sequence having 95% homology to SEQ ID NO:1 is discussed above.

The specification contemplates that the mutant α -amylase has improved properties such as high resistance to heat, but does not lose other beneficial properties of the wild-type α -amylase, such as resistance to chelating agents. Thus, the mutant α -amylases according to the present invention are useful as detergents.

Enablement

The Examiner rejects claims 1, 13-14, 17-24 under 35 U.S.C. § 112, first paragraph for allegedly containing subject matter not enabled by the specification. Claim 14 is canceled, thus rendering rejection thereof moot. Applicants respectfully traverse the rejection applied to the pending claims. Reconsideration of

the claims and withdrawal of the instant rejection are respectfully requested.

The Examiner asserts that final mutant sequences having 70% homology to SEQ ID NO:1 are not enabled by the specification. Claims 1 and 13 are amended to recite that the final mutant sequences have 95% homology to SEQ ID NO:1.

Applicants respectfully submit that the pending claims fully comply with 35 U.S.C. § 112, first paragraph. Withdrawal of the instant rejection is therefore respectfully requested.

Rejection under 35 U.S.C. § 112, second paragraph

The Examiner rejects claims 12 and 16 under 35 U.S.C. § 112, second paragraph for allegedly being indefinite. Claim 16 is canceled, thus rendering rejection thereof moot. Applicants respectfully traverse the rejection of claim 12. Reconsideration of the claims and withdrawal of the instant rejection are respectfully requested.

First, the Examiner asserts that claim 12 is confusing for reciting that a final mutant α -amylase having 95% homology to SEQ ID NO:1 can be obtained from a parent α -amylase having 95% homology to SEQ ID NO:1. Claim 12 is amended to recite that the parent sequence has at least 70% homology to SEQ ID NO:1.

With regard to the homology of the final mutant sequence, the skilled artisan can readily ascertain that if the parent

sequence has 70% homology to SEQ ID NO:1, then only substitutions/deletions can be made that actually increase or maintain the homology of the final mutant sequence at 95%. On the other hand, if the parent sequence already has at least 95% homology to SEQ ID NO:1, then any substitution/deletion can be made to produce the final mutant sequence, so long as the final mutant sequence is 95% homologous to SEQ ID NO:1. In addition, it is possible that the parent and final mutant sequences can each have 95% homology to SEQ ID NO:1. For example, the substitution of a non-homologous amino acid in the parent sequence for another non-homologous amino acid would result in a final mutant sequence maintaining a 95% homology to SEQ ID NO:1. In other words, such a mutation would not change the overall homology to SEQ ID NO:1.

Finally, such deletions/substitutions would not cause the skilled artisan undue experimentation, since the "at least one amino acid" recited in the claims is selected from a small genus of possibilities (i.e., the 11th Tyr, 16th Glu, 49th Asn, 84th Glu, 144th Ser, 167th Gln, 169th Tyr, 178th Ala, 188th Glu, 190th Asn, 205th His and 209th Gln).

Second, the Examiner states that the recitation of "can be improved..." in claim 12 is confusing. In response to the Examiner's remarks, the recitation of "can be" is amended to

"is," and a level of comparison to SEQ ID NO:1 is placed in the claim.

For the above reasons, Applicants respectfully submit that the instant claims particularly point out and distinctly claim the subject matter which is the present invention. Withdrawal of the instant rejection is therefore respectfully requested.

Allowable Claims

Claims 25-27 are allowed. In the Response to the Arguments section of the Office Action, the Examiner states that SEQ ID NO:4 has at least 95% homology to SEQ ID NO:1. Therefore, Applicants add new claims 28 and 29 reciting that the parent sequences are SEQ ID NO:1 and SEQ ID NO:4, respectively. In other words, the claims are drawn to mutants of SEQ ID NOs:1 and 4.

Conclusion

Applicants respectfully submit that the above amendments and/or remarks fully address and overcome the rejections and objections of record. The instant claims are now in condition for allowance. The Examiner is respectfully requested to issue a Notice of Allowance indicating that claims 1, 3, 5-6, 10, 12, 13, 15, and 17-29 are allowed.

If there are any minor matters precluding allowance of the application which may be resolved by a telephone discussion, the

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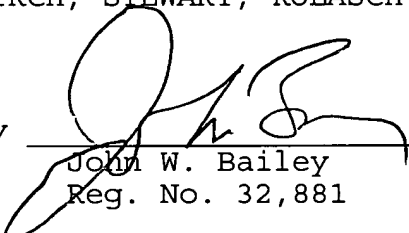
Examiner is respectfully requested to contact Kristi L. Rupert, Ph.D. (Reg. No. 45,702) at (703) 205-8000.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,


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